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IMPROVED ALIGNMENT EVALUATION AND OPTIMIZATION

Problem: A highway alignment optimization model was developed over several years at the University of Maryland and Morgan State University, and demonstrated for the Brookville Bypass in a recently completed SHA project. The project showed that the model can effectively evaluate numerous possible highway alternatives and optimize them based on various user preferences and constraints. From that project, however, it has also been found that (i) the input preparation requirements of the model (largely due to manual map digitization) should be reduced for SHA applications and that (ii) a user-friendly interface that greatly facilitates and speeds up the selection of objectives, preferences, constraints and other input values would be highly desirable. Such model improvements have now been implemented in this project.

Objectives: To develop a user-friendly GIS-based software tool that can be easily used by the SHA personnel to evaluate and optimize highway alignments.

Description: This project develops an easy-to-use graphical user interface for an improved highway alignment optimization model. The developed alignment optimization software can provide detailed and precise estimates for the quantifiable measures of effectiveness for alignments, including right-of-way impacts and costs, earthwork and pavement costs, vehicle operating costs, user time, accessibility, accidents, and sensitive areas affected (e.g., wetlands, parklands and floodplains). The developed software may be used to identify very good highway alternatives at the planning stages of new highways while reducing the resources required for planning and design.

Results: The alignment optimization software was developed and tested. SHA personnel were trained in using the software through a training program arranged by the two universities.

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